

CLAIMS:

1. A nucleic acid molecule comprising a nucleic acid sequence which encodes a polypeptide selected from any one of:

(a) SEQ ID No: 2;

5 (b) an immunogenic fragment comprising at least 12 consecutive amino acids from a polypeptide of (a); and

10 (c) a polypeptide of (a) or (b) which has been modified to improve its immunogenicity, wherein said modified polypeptide is at least 75% identical in amino acid sequence to the corresponding polypeptide of (a) or (b).

2. A nucleic acid molecule comprising a nucleic acid sequence selected from any one of:

(a) SEQ ID Nos: 1;

15 (b) a sequence which encodes a polypeptide encoded by SEQ ID No: 1;

(c) a sequence comprising at least 38 consecutive nucleotides from any one of the nucleic acid sequences of (a) and (b); and

20 (d) a sequence which encodes a polypeptide which is at least 75% identical in amino acid sequence to the polypeptides encoded by SEQ ID No: 1.

3. A nucleic acid molecule comprising a nucleic acid sequence which is anti-sense to the nucleic acid molecule of claim 1.

25 4. A nucleic acid molecule comprising a nucleic acid sequence which encodes a fusion protein, said fusion protein

comprising a polypeptide encoded by a nucleic acid molecule according to claim 1 and an additional polypeptide.

5. The nucleic acid molecule of claim 4 wherein the additional polypeptide is a heterologous signal peptide.

5 6. The nucleic acid molecule of claim 4 wherein the additional polypeptide has adjuvant activity.

7. The nucleic acid molecule according to claim 1, operatively linked to one or more expression control sequences.

8. A vaccine comprising at least one first nucleic acid
10 according to claim 1, and a vaccine vector wherein each first nucleic acid is expressed as a polypeptide, the vaccine optionally comprising a second nucleic acid encoding an additional polypeptide which enhances the immune response to the polypeptide expressed by said first nucleic acid.

15 9. The vaccine of claim 8 wherein the second nucleic acid encodes an additional *Chlamydia* polypeptide.

10. A pharmaceutical composition comprising a nucleic acid according to claim 1 and a pharmaceutically acceptable carrier.

20 11. A pharmaceutical composition comprising a vaccine according to claim 8 and a pharmaceutically acceptable carrier.

12. A unicellular host transformed with the nucleic acid molecule of claim 7.

13. A nucleic acid probe of 5 to 100 nucleotides which
25 hybridizes under stringent conditions to the nucleic acid molecule of SEQ ID No: 1, or to a homolog or complementary or anti-sense sequence of said nucleic acid molecule.

14. A primer of 10 to 40 nucleotides which hybridizes under stringent conditions to the nucleic acid molecules of SEQ ID No: 1, or to a homolog or complementary or anti-sense sequence of said nucleic acid molecule.

5 15. A polypeptide comprising an amino acid sequence selected from any one of:

(a) SEQ ID No: 2;

(b) an immunogenic fragment comprising at least 12 consecutive amino acids from a polypeptide of (a); and

10 (c) a polypeptide of (a) or (b) which has been modified to improve its immunogenicity, wherein said modified polypeptide is at least 75% identical in amino acid sequence to the corresponding polypeptide of (a) or (b).

16. A fusion polypeptide comprising the polypeptide of
15 claim 15 and an additional polypeptide.

17. The fusion polypeptide of claim 16 wherein the additional polypeptide is a heterologous signal peptide.

18. The fusion protein of claim 16 wherein the additional polypeptide has adjuvant activity.

20 19. A method for producing a polypeptide of claim 15, comprising the step of culturing a unicellular host according to claim 12.

20. An antibody against the polypeptide of claim 15.

21. A vaccine comprising at least one first polypeptide
25 according to claim 15 and a pharmaceutically acceptable carrier, optionally comprising a second polypeptide which enhances the immune response to the first polypeptide.

22. The vaccine of claim 21 wherein the second polypeptide comprises an additional *Chlamydia* polypeptide.

23. A pharmaceutical composition comprising a polypeptide according to claim 15 and a pharmaceutically acceptable 5 carrier.

24. A pharmaceutical composition comprising a vaccine according to claim 21 and a pharmaceutically acceptable carrier.

25. A pharmaceutical composition comprising an antibody 10 according to claim 20 and a pharmaceutically acceptable carrier.

26. A method for preventing or treating *Chlamydia* infection using the nucleic acid of claim 1.

27. A method for preventing or treating *Chlamydia* 15 infection using the vaccine of claim 8.

28. A method for preventing or treating *Chlamydia* infection using the pharmaceutical composition of claim 10.

29. A method for preventing or treating *Chlamydia* infection using the polypeptide of claim 15.

20 30. A method for preventing or treating *Chlamydia* infection using the antibody of claim 20.

31. A method of detecting *Chlamydia* infection comprising the step of assaying a body fluid of a mammal to be tested with the nucleic acid of claim 1.

25 32. A method of detecting *Chlamydia* infection comprising the step of assaying a body fluid of a mammal to be tested with the polypeptide of claim 15.

33. A method of detecting *Chlamydia* infection comprising the step of assaying a body fluid of a mammal to be tested with the antibody of claim 20.

34. A method for identifying the polypeptide of claim 15
5 which induces an immune response effective to prevent or lessen the severity of *Chlamydia* infection in a mammal previously immunized with polypeptide, comprising the steps of:

- (a) immunizing a mouse with the polypeptide; and
- (b) inoculating the immunized mouse with *Chlamydia*;

10 wherein the polypeptide which prevents or lessens the severity of *Chlamydia* infection in the immunized mouse compared to a non-immunized control mouse is identified.

35. Expression plasmid pCACPNM209.

36. A nucleic acid molecule of SEQ ID NOS. 3 or 4.

15 37. A peptide of any one of SEQ ID NOS. 5 to 7.

38. An isolated ATP-binding cassette from *Chlamydia*.